APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/339,959	06/25/1999	TOSHIAKI KAKUTANI	4947-0074-2	3282

22850	7590	02/12/2004

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EXAMINER
VIDA, MELANIE M

ART UNIT	PAPER NUMBER
2626	

DATE MAILED: 02/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _03 November 2003_.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _1-15_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) _1-15_ is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on _03 November 2003_ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

    a) ☐ The translation of the foreign language provisional application has been received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.

4) ☐ Interview Summary (PTO-413) Paper No(s). _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1.   This action is responsive to an amendment filed on 11/3/03. Claims 1-15 are pending.

Response to Arguments

2.   Applicant's arguments with respect to claims 1-15 have been considered but are moot in

view of the new ground(s) of rejection.

Double Patenting

3.   The nonstatutory double patenting rejection is based on a judicially created doctrine
grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or
improper timewise extension of the "right to exclude" granted by a patent and to prevent possible
harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed.
Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686
F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA
1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).
        A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to
overcome an actual or provisional rejection based on a nonstatutory double patenting ground
provided the conflicting application or patent is shown to be commonly owned with this
application. See 37 CFR 1.130(b).
        Effective January 1, 1994, a registered attorney or agent of record may sign a terminal
disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37
CFR 3.73(b).

4.   **Claim 1-15** are rejected under the judicially created doctrine of obviousness-type double

patenting as being unpatentable over claims 1, 4, 12, 20, and 23 of U.S. Patent No. 6,439,682 B1,

(hereinafter, '682). Although the conflicting claims are not identical, they are not patentably

distinct from each other because **claim 1** of the present invention is an obvious variation of claim

12 in the '682 patent as shown in the table immediately below.

Claim 1 (Application)	Claim 12 ('682)
Printer-system creates a plurality of dots, (lines 1-2).	Printing apparatus that prints a distribution of dots, (col. 33, lines 10-11).
Head to produce N-different dots having different densities per unit area, where N is not less than 2, (lines 3-4).	Head prints a distribution of dots with at least two different inks with different densities, and creating at least three types of dots, (col. 33, lines 10-18).
Input unit to input tone data from an original image, (lines 5-6).	Input unit that inputs tone data of an image to be printed, (col. 33, lines 25-27).
Threshold value storage unit to store a plurality of threshold values according to possible tone values that correspond to P different dots, (lines 7-10).	A dither determination unit comprises a memory unit in which a relationship between tone data and a recording ratio regarding each of the at least three different types of dots is stored, (col. 33, lines 46-51).
Multi-valuing unit to determine on-off state of N different dots based on density data obtained by an error diffusion where error represents a difference between density to be expressed of a processed pixel and the dot actually created in the pixel.	An error diffusion determination unit that determines on-off state of a dot type by error diffusion, and correcting tone data with density errors, (col. 33, lines 35-42).
Dot creation unit to drive head and create N different densities per unit area, (lines 16-17).	Dot creation unit that drives head based on dither determination unit and error diffusion to create the respective types of dots, (col. 33, lines 43-46).

Therefore, these differences listed above are an obvious variation of each other.

Claim 9 of the present invention contains all the features of claim 1 of the present

invention and further a noise addition unit. Claim 12 of the '682 patent recites a dither

determination unit that determines the on-off state of at least three different types of dots. The

'682 patent discloses an embodiment wherein a dither matrix is a blue noise mask-type dither

matrix, (col. 19, lines 12-15). Therefore, these differences are an obvious variation of the patent.

Claim 12 of the present invention is an obvious variation of claim 4 in the '682 patent as

shown in the table immediately below.

Claim 12 (Application)	Claim 4 ('682 Patent)
A method to create a plurality of dots on a medium with a head that creates N different dots having different densities per unit area, where N is an integer not less than 2, (lines 1-4).	A method of printing a multi-tone image with a distribution of dots with a head with two different inks, wherein the dots have different densities, and creates at least three different dots on a medium, (col. 30, lines 66 through col. 31, lines 6).
(a) Inputting tone data with respect to each of pixels included in an original image, (lines 5-6).	(a) Inputting tone data of an image to be printed, (col. 31, lines 6-8).
(b) Referring to data that stores a plurality of threshold values according to possible tone values that the input tone value may take and determining the plurality of threshold values corresponding to the input tone data, the plurality of threshold values including corresponding threshold values that correspond to P different dots, where P is an integer that does not exceed N and does not fall under 2, (lines 6-10).	(c2) Comparing the recording ratio set in step (c1) with the threshold value read from a dither matrix and determining an on-off state of a dot based on the comparison, and (c3) Comparing a corrected recording ratio with the threshold value to determine on-off state of another dot, (col. 31, lines 34-51).
(c) Determining an on-off state of a dot and which of the N different dots is to be created in each pixel based on density data obtained by error diffusion distribution of an error, said error representing a difference between a density to be expressed in a processed pixel, and a density expressed by a dot actually created in the pixel, (lines 11-14).	(d) Determining on-off state of one type of dot in a second group by an error diffusion method based on correction data, the correction data being obtained by correcting the tone data with density errors occurring due to the on-off state of the plurality of dots in said first group, (col. 31, lines 21-26).
(d) Driving said head and creating N different densities per unit area based on the results of the determination in step (b), (lines 15-16).	(e) Driving said head based on results of the determinations carries out in said step (c) or step (d), (col. 31, lines 26-29).
(e) Driving said head and creating N different densities per unit area based on the results of the determination in step (c), (lines 17-18).	(e) Driving said head based on results of the determinations carries out in said step (c) or step (d), (col. 31, lines 26-29).

Therefore, these differences listed above are an obvious variation of each other.

   Claim 13 of the present invention contains all the steps for the method of claim 12 of the

present invention, and further discloses adding present noise data to either one of the input tone

data and at last a part of a plurality of threshold values. Claim 4 of the '682 patent recites

comparing the recording ratio with a threshold value in a dither matrix to determine an on-off

state of the specific dot, (col. 31, lines 34-39). The '682 patent discloses an embodiment wherein

a dither matrix is a blue noise mask-type dither matrix, (col. 19, lines 12-15). Therefore, these

differences are an obvious variation of each other.

   Claim 14 of the present invention is an obvious variation of claim 20 in the '682 patent

as shown in the table immediately below.

Claim 14 (Application)	Claim 20 ('682 Patent)
A recording medium, in which a program for driving a printer is recorded in a computer readable medium, said printer creating a plurality of dots and thereby printing an image on a printing medium, said program causing a computer to attain the functions, (lines 1-4).	A recording medium for enabling a multi-tone image to be printed by way of a printing apparatus having two different inks that can print in three different types of dots with identical hue, but different densities, (col. 35, lines 28-36).
Stores a plurality of threshold values according to tone values that input tone data may be assigned, and determining the threshold values corresponding to the input tone data, that correspond to at least two different dots having different densities per unit area, (lines 5-8).	Comparing the recording ratio of a specific dot, which is a first object of the determination, with a threshold value read from a dither matrix that has been provided in advance and determining on-off state of the specific dot based on a result of comparison, (col. 36, lines 5-9).
Determining an on-off state of a dot and which of the N different dots is to be created in each pixel based on density data obtained by error diffusion distribution of an error, said error representing a difference between a density to be expressed in a processed pixel and a density expressed by a dot actually created in the pixel, (lines 9-12).	A third program code causes the computer to determine on-off state of the at least one type of dot having the lower density evaluation value by an error diffusion method based on correction data, the correction data being obtained by correcting the tone data with density errors occurring due to the on-off state of the plurality of dots having the higher density evaluation values, (col. 35, lines 53-

	60).

These differences are all obvious variations of each other.

Claim 15 of the present invention contains all the functions of the recording medium in a program for driving a printer as in claim 14 of the present invention, but further contains the function of adding preset noise data to either the input tone data or a plurality of threshold values. Claim 23 in the '682 patent recites providing a new dither matrix, which includes threshold values in a different arrangement specified for each of the at least two different inks, from a dither matrix stored in advance, (col. 36, lines 35-39). The '682 patent discloses an embodiment wherein a dither matrix is a blue noise mask-type dither matrix, (col. 19, lines 12-15). These differences are all obvious variations of each other.

5.   **Claims 1-15** are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, and 4-5 of U.S. Patent No. 6,382,757 B1, (hereinafter, '757). Although the conflicting claims are not identical, they are not patentably distinct from each other because **claim 1** of the present invention is an obvious variation of the claims 1 as shown in the table immediately below.

Claim 1 (Application)	Claims 1, 4-5, ('757 Patent)
Printer-system creates a plurality of dots, (lines 1-2).	A printer that creates a plurality of dots and thereby prints an image on a printing medium, (claim 1, col. 23, lines 8-11).
A head configured to produce N different dots having different densities per unit area, where N is an integer of not less than 2; (lines 3-4).	A head that provides a plurality of inks comprising at least two inks of different densities with respect to at least one hue and enables creation of at least two different dots having different quantities of ink for each of the plurality of inks, (claim 1, col. 23, lines 14-19).
Input unit to input tone data from an original	An input unit that inputs image data for each of

image, (lines 5-6).	pixels included in an original image, (claim 1, col. 23, lines 12-14).
Threshold value storage unit to store a plurality of threshold values according to possible tone values that correspond to P different dots, (lines 7-10).	Multi-valuing unit applies a dither method, (claim 4, col. 23, lines 45-46).
Multi-valuing unit to determine on-off state of N different dots based on density data obtained by an error diffusion where error represents a difference between density to be expressed of a processed pixel and the dot actually created in the pixel.	Multi-valuing unit applies an error diffusion method, (claim 5, col. 23, lines 47-48).
Dot creation unit to drive head and create N different densities per unit area, (lines 16-17).	A dot creation unit that creates dots in the on state. (claim 1, line 28-30).

Therefore, these differences listed above are an obvious variation of each other.

6.   **Claims 1-15** are rejected under the judicially created doctrine of obviousness-type double

patenting as being unpatentable over claims 1, 5, 13-14 of U.S. Patent No. 6,099,105 B1,

(hereinafter, '105). Although the conflicting claims are not identical, they are not patentably

distinct from each other because **claim 1** of the present invention is an obvious variation of claim

9 in the '682 patent as shown in the table immediately below.

Claim 1 (Application)	Claims 1, 5, 13, and 14 ('105)
Printer-system creates a plurality of dots, (lines 1-2).	A printing system forms at least two different dots having different densities per unit area, (claim 1, col. 31, lines 29-30).
Head to produce N-different dots having different densities per unit area, where N is not less than 2, (lines 3-4).	A head which forms at least two different dots having different densities per unit area, on an object for recording a multi-tone image by distribution of dots, (claim 1, col. 31, lines 29-32).
Input unit to input tone data from an original image, (lines 5-6).	Input means, (claim 1, col. 31, lines 33-34).
Threshold value storage unit to store a plurality of threshold values according to possible tone values that correspond to P different dots, (lines 7-10).	The first dot formation determination means uses a threshold matrix of discrete dither, (claim 1, col. 31, line 42-47; and

	claims 13-14, col. 33, lines 60-65).
Multi-valuing unit to determine on-off state of N different dots based on density data obtained by an error diffusion where error represents a difference between density to be expressed of a processed pixel and the dot actually created in the pixel.	Error diffusion means, (claim 5, col. 32, lines 45-58).
Dot creation unit to drive head and create N different densities per unit area, (lines 16-17).	Head driving means (claim 1, col. 31, lines 59-63).

Therefore, these differences listed above are an obvious variation of each other.

Claim 9 of the present invention contains all the features of claim 1 of the present invention and further a noise addition unit. Claims 13-14 of the '105 patent recites a first dot formation determination means determines the formation or non-formation of the dot by a dither method, or it uses a threshold matrix of discrete dither. The '105 patent discloses a blue noise matrix for the threshold matrix of discrete dither, (col. 16, lines 20-24). Therefore, these differences are an obvious variation of the patent.

7.   **Claims 1-15** are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 5-6, and 11-12, US Patent No. 6,089,691, (hereinafter, '691). Although the conflicting claims are not identical, they are not patentably distinct from each other because **claim 1** of the present invention is an obvious variation of claims of the '691 patent as shown in the table immediately below.

Claim 1 (Application)	Claims 1, 5-6, 11-12, ('691 Patent)
Printer-system creates a plurality of dots, (lines 1-2).	Printing system for forming at least two types of dots having different hues on an object, said printing system recording a multi-tone image through a distribution of

	said dots, (claim 1, col. 30, lines 10-13).
Head to produce N-different dots having different densities per unit area, where N is not less than 2, (lines 3-4).	A head for forming at least two types of dots having different hues for forming at least two different hues on an object, (claim 1, col. 30, lines 10-13).
Input unit to input tone data from an original image, (lines 5-6).	Input means for inputting a multi-color tone signals, (claim 1, col. 30, lines 14-16).
Threshold value storage unit to store a plurality of threshold values according to possible tone values that correspond to P different dots, (lines 7-10).	First dot formation means, Second dot formation means, (claim 1, col. 30, lines 17-33); Dither Method, Threshold matrix, (claim 5, col. 30, lines 58-67; claim 11-12, col. 32, lines 5-12).
Multi-valuing unit to determine on-off state of N different dots based on density data obtained by an error diffusion where error represents a difference between density to be expressed of a processed pixel and the dot actually created in the pixel.	Error diffusion means, (claim 6, col. 31 lines 5-20).
Dot creation unit to drive head and create N different densities per unit area, (lines 16-17).	Head drive means for driving said head, (claim 1, col. 30, lines 34-38).

Therefore, these differences listed above are an obvious variation of each other.

Claim 9 of the present invention contains all the features of claim 1 of the present invention and further a noise addition unit. Claims 5-6, and 11-12 of the '691 patent recites a first and second dot formation determination means determines the formation or non-formation of the dot by a dither method, and it uses a threshold matrix of discrete dither. The '691 patent discloses a blue noise matrix for the threshold matrix of discrete dither, (col. 17, lines 50-57). Therefore, these differences are an obvious variation of the patent.

8.   **Claims 1-15** are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 5, and 11, US Patent No. 6,338,538, (hereinafter, '538). Although the conflicting claims are not identical, they are not patentably distinct from

each other because **claim 1** of the present invention is an obvious variation of claims of the '691

patent as shown in the table immediately below.

Claim 1 (Application)	Claims 1, 5, 11, ('538 Patent)
Printer-system creates a plurality of dots, (lines 1-2).	Image Processing system which converts original image data to a distribution of at least two different types of dots having different densities per unit area on an object, (col. 31, claim 1, lines 27-30).
Head to produce N-different dots having different densities per unit area, where N is not less than 2, (lines 3-4).	A distribution of at least two different types of dots having different densities per unit area on an object, (col. 31, claim 1, lines 27-30).
Input unit to input tone data from an original image, (lines 5-6).	Recording density inputting means, (col. 31, claim 1, lines 31-36).
Threshold value storage unit to store a plurality of threshold values according to possible tone values that correspond to P different dots, (lines 7-10).	Multi-one section comprising a first multivaluing means, a second multivaluing means, (col. 31, claim 1, lines 38-50).
Multi-valuing unit to determine on-off state of N different dots based on density data obtained by an error diffusion where error represents a difference between density to be expressed of a processed pixel and the dot actually created in the pixel.	Error diffusion means, (col. 32, claim 5, lines 25-35).
Dot creation unit to drive head and create N different densities per unit area, (lines 16-17).	At least two different dots having different densities per unit area are formed in different diameters, (col. 32, claim 11, lines 65-67).

Therefore, these differences listed above are an obvious variation of each other.

Claim 9 of the present invention contains all the features of claims 1 of the present

invention and further a noise addition unit. Claims 5-6, and 9-10 of the '538 patent recites a first

and second multivaluing means, and it uses a threshold matrix of discrete dither, (col. 32, lines

18-50; lines 59-64). The '538 patent discloses a blue noise matrix for the threshold matrix of

discrete dither, (col. 16, lines 25-27). Therefore, these differences are an obvious variation of the patent.

Conclusion

9.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

 Takayama et al. US Patent 6,443,548 B1, printing method with a plurality of inks with different densities.

Kakutani US Patent No. 6,543,870 image processing system with halftoning in an ink jet printer with noise data simulating a halftone dot pattern.

Yonekubo et al. US Patent No. 6,328,400 a printing system with nozzles for forming ink of different diameters.

Kakutani US Patent No. 6,602,003 B2, a print control device for printing a medium size dot or a small size dot.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie M Vida whose telephone number is (703) 306-4220. The examiner can normally be reached on 8:30 am 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly A Williams can be reached on (703) 305-4863. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

                                        Melanie M Vida
                                        Examiner
                                        Art Unit 2626

MMV
mmv

February 4, 2004

                                        KIMBERLY WILLIAMS
                                        SUPERVISORY PATENT EXAMINER